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BIRCH STEWART KOLASCH & BIRCH				
PO BOX 747				
FALLS CHURCH, VA 22040-0747				
EXAMINER				
CALANDRA, ANTHONY J				
ART UNIT		PAPER NUMBER		
1791				
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08/22/2008		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary

Application No.

10/591,350

Applicant(s)

KOGA ET AL.

Examiner

ANTHONY J. CALANDRA

Art Unit

1791

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 8/31/2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/IS/CI)
Paper No(s)/Mail Date 7/22/2008 and 11/30/2006
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Detailed Office Action

1. The communication dated 8/31/2006 has been entered and fully considered.
2. Claims 1-5 are currently pending.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Method for treating papermaking waste water using a silicon-aluminum based inorganic polymer.

Drawings

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the organic polymer being added of claim 1 must be shown or the feature canceled from the claim. No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet"

pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claim 2 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

In claim 2, it is stated that the papermaking waste water is controlled to a 5 to 8 by *merely* adding the silica-aluminum based inorganic polymer flocculent. However, since the silica-alumina inorganic polymer is acidic, it can only lower the pH of the wastewater. Therefore in cases where the waste water pH is already low (say pH of 5), the addition of the inorganic polymer will lower the pH out of the desired range unless an additional pH changing component is added (other than said inorganic polymer). Therefore for certain pH's, the pH cannot be controlled by merely (where merely is interpreted as only) adding the silica-aluminum based inorganic polymer in a way understood by a person of ordinary skill in the art.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1 the grammar/structure of the claim is written as to be indefinite. The examiner suggests the below wording to properly capture the metes and bounds of the claim. Claims 2-3 are dependent on claim 1 and are similarly rejected.

Examiner has interpreted claim 1 as "A method for treating papermaking waste water, which comprises *adding* a silica-aluminum based inorganic polymer flocculent having an Si/Al molar ratio of 0.2 to 1.5 *into* a papermaking waste water having a pH or adjusted pH of 5 to 14 such that the concentration of the inorganic polymer flocculent becomes 1 to 250 (mg-Al/L) in terms of aluminum to control the pH of the papermaking waste water to 5 to 8 and then adding an organic polymer flocculent".

In claim 2, the applicant states that the pH of the papermaking waste is controlled to 5 to 8 by merely adding the silica-aluminum based inorganic polymer. It is not clear if other chemicals cannot be added to adjust the pH at any time during the instant claimed method or only during/after the addition of the Al/Si inorganic polymer. Therefore the examiner cannot determine the proper metes and bound of patent protection desired by the applicant. Claim 1 states that the Si/Al inorganic polymer can be added to waste water or adjusted waste water. Examiner has interpreted adjusted waste water as waste water that has had its pH changed before adding Si/Al inorganic polymer.

Claim 4 and 5 provides for the use of a silica sol by adding aluminum sulfate as a flocculent for papermaking waste water, but, since the claim does not set forth any steps involved in the method/process (the claim does not state how the inorganic polymer is used), it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

For purpose of examination, the examiner has interpreted the claim as meaning that the pH of the water can only be adjusted by other chemicals prior to adding the Si/Al inorganic polymer.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 4 and 5 are rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claim 4 is rejected under 35 U.S.C. 102(b) as being anticipated by “*Study on the treatment of papermaking wastewater by polymeric aluminum sulfate silicate*”, hereinafter CHINA.

As for claim 4, the CHINA discloses adding a dissolved sodium silicate solution and reacting it with H₂SO₄ which is a halogen free mineral acid (*A method of using silica sol which uses silica sol produced by reacting a sodium silicate solution with a halogen-free mineral acid as a retention aid and uses a silica-aluminum based inorganic polymer flocculant produced by adding aluminum sulfate to the silica sol*). CHINA discloses a SiO₂ to Al ratio of 1:1 which is equivalent to a 0.47:1 Si to Al ratio, which is a specific point within the instant claimed range (*a Si/Al molar ratio of 0.2 to 1.5 as a flocculent* [section 2.2; 1 SiO₂* MW Si/MW SiO₂; 1 * 28/60 = 0.46 Si: 1 Al]). CHINA discloses adding the flocculent to wastewater (*for papermaking waste water* [section 1.2, 2.1, and 2.2]).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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12. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

13. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP5302291 TAKAHASHI, hereinafter TAKAHASHI, in view of “*Study on the treatment of papermaking wastewater by polymeric aluminum sulfate silicate*”, hereinafter CHINA.

TAKAHASHI discloses adding an inorganic polymer to a waste liquor of pulp at a pH of 4 to 6. Subsequent to adding the inorganic polymer the pH is adjusted to a pH of 5-7.0 and then an organic polymer is added [eps@cenet English translation]. TAKAHASHI does not (appear to) disclose adding the silicon-aluminum polymer as the instant claim.

CHINA discloses treating a papermaking wastewater with a silica-aluminum flocculant (PASS) (*A method for treating papermaking waste water, which comprises having a silica-aluminum based inorganic polymer* [section 1.2 and 2.1]). CHINA discloses the flocculant having a SiO₂ to Al ratio of 1:1 which is equivalent to a 0.47:1 Si to Al ratio (*flocculant having a Si/Al molar ratio of 0.2 to 1.5* [section 2.2; 1 SiO₂* MW Si/MW SiO₂; 1 * 28/60 = 0.46 Si: 1 Al]). CHINA discloses adding the flocculant to a wastewater with a pH of 7.32 (*to a pH wastewater of contained in papermaking waste water having a pH or adjusted pH of 5 to 14 such that the concentration of the inorganic polymer* [section 2.1]). CHINA discloses adding 100 mg/L based on SiO₂, since CHINA discloses a 1:1 Al:SiO₂ ratio, the Al concentration is also

100 g/L which falls within the instant claimed range and discloses that the flocculent works best in the control range of 5-11 (*flocculant becomes 1 to 250 (mg-Al/L) in terms of aluminum to control the pH of the papermaking waste water to 5 to 8 [Table 1 and section 2.3]*).

At the time of the invention it would have been *prima facie* obvious to substitute the inorganic metal polymer of TAKAHASHI for the inorganic polymer of CHINA. A person of ordinary skill in the art would expect both polymers to cause flocculation. It is *prima facie* obvious to substitute one known component for another with expectation of yielding predictable results.

As for claim 2, CHINA discloses that the silicon-aluminum inorganic polymer is added to a wastewater of a pH of 7.32 [section 2.1]. This pH is within the range that CHINA discloses as acceptable for use of the inorganic polymer [section 2.3]. Therefore, no additional change in pH is required.

14. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over “*Study on the treatment of papermaking wastewater by polymeric aluminum sulfate silicate*”, hereinafter CHINA and WO 03/029151 A1 FRUH et al, hereinafter FRUH.

Examiner has used U.S. Patent 6,929,759 as the English Language Equivalent of FRUH and will refer to this document.

As for claim 1, CHINA discloses treating a papermaking wastewater with a silica-aluminum flocculant (PASS) (*A method for treating papermaking waste water, which comprises having a silica-aluminum based inorganic polymer* [section 1.2 and 2.1]). CHINA discloses the flocculant having a SiO₂ to Al ratio of 1:1 which is equivalent to a 0.47:1 Si to Al ratio (*flocculant having a Si/Al molar ratio of 0.2 to 1.5* [section 2.2; 1 SiO₂* MW Si/MW SiO₂;

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1 * 28/60 = 0.46 Si : 1 Al]). CHINA discloses adding the flocculant to a wastewater with a pH of 7.32 (*to a pH wastewater of contained in papermaking waste water having a pH or adjusted pH of 5 to 14 such that the concentration of the inorganic polymer* [section 2.1]). CHINA discloses adding 100 mg/L based on SiO₂, since CHINA discloses a 1:1 Al:SiO₂ ratio, the Al concentration is also 100 g/L which falls within the instant claimed range and discloses that the flocculent works best in the control range of 5-11 (*flocculant becomes 1 to 250 (mg-Al/L) in terms of aluminum to control the pH of the papermaking waste water to 5 to 8* [Table 1 and section 2.3]).

CHINA does not disclose adding an additional organic polymer to the wastewater. FRUH discloses that additional organic polymers can be combined with inorganic polymers such as poly-aluminum silicate sulphate [column 4 lines 27-68]. At the time of the invention it would have been obvious to a person of ordinary skill in the art to add an additional organic polymer to the silicon-aluminum inorganic polymer of CHINA to clarify the water. A person of ordinary skill in the art would be motivated by the fact that the combined organic/inorganic polymer produced excellent results, including large sludge flakes, effectiveness during cold periods, low concentration requirement, and good BOD, COD elimination [column 6 lines 1 -47]. Further, in addition to the TSM rationalization, it is *prima facie* obvious to combine two known components intended for the same purpose [see e.g. MPEP 2144.06 (I) Combining Equivalents Known for the Same Purpose].

FRUTH discloses that the inorganic/organic polymers are mixed together and then added to the wastewater. The instant claim states that the inorganic polymer is added first and then the organic polymer is added. However, at the time of the invention it would have been *prima facie*

obvious to change the sequence of the addition of ingredients, absence evidence off unexpected results [see e.g. MPEP 2144.04 (IV) (C) Changes in Sequence of Adding Ingredients].

As for claim 2, CHINA discloses that the silicon-aluminum inorganic polymer is added to a wastewater of a pH of 7.32 [section 2.1]. This pH is within the range that CHINA discloses as acceptable for use of the inorganic polymer [section 2.3]. Therefore, no additional change in pH is required.

15. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP5302291 TAKAHASHI, hereinafter TAKAHASHI, in view of “*Study on the treatment of papermaking wastewater by polymeric aluminum sulfate silicate*”, hereinafter CHINA, as applied to claim 1 and 2 above, and further in view of, if necessary, US Publication 2003/0019815 KOGA et al., hereinafter KOGA.

CHINA states that the H₂SO₄ is added to adjust a pH value and that sodium silicate is diluted to reach a certain solution. CHINA does not disclose the adjusted pH or the certain concentration. However, by mentioning these two variables it is clear that CHINA recognizes them both as result effective variables. Therefore at the time of the invention it would have been *prima facie* obvious to optimize both the concentration and the pH of the solution [see e.g. MPEP 2144.05 (II) (B) Optimization of ranges and result effective variables].

Alternatively, should the applicant be unconvinced, a SiO₂ concentration of 5 to 25 g/L and a pH of 1.5 to 2.5 would have been obvious in light of KOGA. KOGA discloses that the SiO₂ concentration of 10 to 30 g/L in a silica sol [0048] and a pH of 1 to 3 in a silica sol [0049]. A person of ordinary skill would initially look to KOGA for information on preparing the silica sol of CHINA that is mixed with the aluminum compound.

While KOGA discloses silica sol inorganic polymers and the instant claims disclose a silica-sol aluminum mixture inorganic polymer it is *prima facie* obvious to use a known technique such as adjusting an inorganic polymers pH and concentration to obtain a predictable result such as better storage stability, ease of handling, and viscosity change. At the time of the invention it would have been obvious to a person of ordinary skill in the art to apply the teachings of KOGA to obtain a stable silica-aluminum inorganic polymer that does not gel up.

Alternatively, a person of ordinary skill in the art could look to KOGA for teachings that suggest both pH and concentration are result effective variables which affect the properties of inorganic polymers such as silica sol. A person of ordinary skill in the art would therefore be motivated to optimize both of these parameters as they are shown to have an effect on gelling, storage, and viscosity [0006, 0007 and 0045].

16. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over “*Study on the treatment of papermaking wastewater by polymeric aluminum sulfate silicate*”, hereinafter CHINA and WO 03/029151 A1 FRUH et al, hereinafter FRUH, as applied to claim 1 and 2 above, and further in view of, if necessary, US Publication 2003/0019815 KOGA et al., hereinafter KOGA.

Examiner has used U.S. Patent 6,929,759 as the English Language Equivalent of FRUH and will refer to this document.

FRUH discloses that for optimum storage stability the pH should be 0.3 to 4, which overlaps with the instant claimed range [column 5 lines 1-5]. However, this is for a combination of different inorganic/organic polymers and not the silica-aluminum inorganic polymer alone. CHINA states that the H₂SO₄ is added to adjust a pH value and that sodium silicate is diluted to

reach a certain solution. CHINA does not disclose the adjusted pH or the certain concentration. However, by mentioning these two variables it is clear that CHINA recognizes them both as result effective variables. FRUH recognizes that pH has an important effect on stability. Therefore at the time of the invention it would have been *prima facie* obvious to optimize both the concentration and the pH of the solution [see e.g. MPEP 2144.05 (II) (B) Optimization of ranges and result effective variables].

Alternatively, should the applicant be unconvinced, a SiO₂ concentration of 5 to 25 g/L and a pH of 1.5 to 2.5 would have been obvious in light of KOGA. KOGA discloses that the SiO₂ concentration of 10 to 30 g/L in a silica sol [0048] and a pH of 1 to 3 in a silica sol [0048]. A person of ordinary skill would initially look to KOGA for information on preparing the silica sol of CHINA that is mixed with the aluminum compound.

While KOGA discloses silica sol inorganic polymers and the instant claims disclose a silica-sol aluminum mixture inorganic polymer it is *prima facie* obvious to use a known technique such as adjusting an inorganic polymers pH and concentration to obtain a predictable result such as better storage stability, ease of handling, and viscosity change. At the time of the invention it would have been obvious to a person of ordinary skill in the art to apply the teachings of KOGA to obtain a stable silica-aluminum inorganic polymer that does not gel up [0006, 0007 and 0045].

Alternatively, a person of ordinary skill in the art could look to KOGA for teachings that suggest both pH and concentration are result effective variables which affect the properties of inorganic polymers such as silica sol. A person of ordinary skill in the art would therefore be

motivated to optimize both of these parameters as they are shown to have an effect on gelling, storage, and viscosity [0006, 0007 and 0045].

17. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over “*Study on the treatment of papermaking wastewater by polymeric aluminum sulfate silicate*”, hereinafter CHINA and, if necessary, US Publication 2003/0019815 KOGA et al., hereinafter KOGA.

CHINA states that the H₂SO₄ is added to adjust a pH value and that sodium silicate is diluted to reach a certain solution. CHINA does not disclose the adjusted pH or the certain concentration. However, by mentioning these two variables it is clear that CHINA recognizes them both as result effective variables. Therefore at the time of the invention it would have been *prima facie* obvious to optimize both the concentration and the pH of the solution [see e.g. MPEP 2144.05 (II) (B) Optimization of ranges and result effective variables]. .

Alternatively, should the applicant be unconvinced, a SiO₂ concentration of 5 to 25 g/L and a pH of 1.5 to 2.5 would have been obvious in light of KOGA. KOGA discloses that the SiO₂ concentration of 10 to 30 g/L in a silica sol [0048] and a pH of 1 to 3 in a silica sol [0049]. A person of ordinary skill would initially look to KOGA for information on preparing the silica sol of CHINA that is mixed with the aluminum compound.

While KOGA discloses silica sol inorganic polymers and the instant claims disclose a silica-sol aluminum mixture inorganic polymer it is *prima facie* obvious to use a known technique such as adjusting an inorganic polymers pH and concentration to obtain a predictable result such as better storage stability, ease of handling, and viscosity change. . At the time of the invention it would have been obvious to a person of ordinary skill in the art to apply the

teachings of KOGA to obtain a stable silica-aluminum inorganic polymer that does not gel up [0006, 0007 and 0045].

Alternatively, a person of ordinary skill in the art could look to KOGA for teachings that suggest both pH and concentration are result effective variables which affect the properties of inorganic polymers such as silica sol. A person of ordinary skill in the art would therefore be motivated to optimize both of these parameters as they are shown to have an effect on gelling, storage, and viscosity [0006, 0007 and 0045].

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY J. CALANDRA whose telephone number is (571) 270-5124. The examiner can normally be reached on Monday through Thursday, 7:30 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AJC

/Eric Hug/

Primary Examiner, Art Unit 1791